

## **MOUNTAIN PLOVER (*Charadrius montanus*)**

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### **Criteria Scores**

| Population Trend | Range Trend | Population Size | Range Size | Endemism | Population Concentration | Threats |
|------------------|-------------|-----------------|------------|----------|--------------------------|---------|
| 15               | 20          | 7.5             | 10         | 7.5      | 5                        | 5       |

### **Special Concern Priority and Other Designations**

*California*: Currently ranked as a Bird Species of Special Concern (wintering), Priority 1.

Considered a Bird Species of Special Concern (Remsen 1978), Bird Species of Special Concern list update (Anonymous 1992), and on the list of Special Animals (CDFG 2001).

*Federal*: Included on list of Migratory Nongame Birds of Management Concern (USFWS 1995); Proposed for listing as a Threatened Species (USFWS 1999)

*Other*: Focus species for California Partners in Flight Grassland Conservation Plan (PRBO 1997); Partners in Flight National Watch List; IUCN listing of Vulnerable species due to an observed, estimated, inferred or suspected [population] reduction over the last 10 years due to a decline in abundance in area of occupancy and/or decline in habitat quality (VU/A1bc+, 2bc+).

### **Breeding Bird Survey Statistics for California**

Does not breed in California. Analysis of Christmas Bird Count (CBC ) data from 1980 - 1997 indicates 85% of nationwide CBC counts reporting mountain plovers were in California and 95% of all birds detected in any year for all CBC count circles were in California during that period (Hunting et al 2001). Both the number of birds observed and the number of CBC count circles reporting mountain plovers have decreased since 1980. Observations suggest population decreases along the coast are most significant.

### **General Range and Abundance**

Breeds east of the Rocky Mountains from Montana to New Mexico, western Texas and western

Oklahoma south to central New Mexico. Most birds breed in northern Montana and in southeastern Colorado and Wyoming (USFWS 1999). The species winters in central and southern California, southern Arizona, southern Texas, and northern Mexico with primary wintering areas in the Central and Imperial valleys of California (Knopf 1996). Winter range in California includes the San Joaquin valley, northern Sacramento valley, central and southern California coastal valleys, southern California coastal plains, western San Bernardino and Imperial counties, and in the vicinity of the Salton Sea, Imperial county.

The Pawnee National Grassland (Weld County, Colorado) is a stronghold for breeding mountain plovers with recent estimates of about 1,200 breeding birds (Knopf and Rupert 1996, Graul and Webster 1976). In 1994, a National Audubon Society (NAS) census detected an estimated 3,346 birds at 25 sites in 9 California counties (NAS, Unpubl. Data). A 1998 census, coordinated by the CDFG, counted 2,663 birds at 31 sites in 11 California counties (Hunting et al 2001). In both 1994 and 1998, about 80% of all birds were detected in southern California with the majority detected in either Yolo or Imperial counties. Knopf (1996) speculated that up to half of the birds wintering in California may have been missed during the census suggesting a California wintering population of 4,000 to 7,000 birds.

Hunting, et al. (2001) suggested a range in California encompassing approximately 14.92 million km<sup>2</sup> or about 3% of the state. The wintering range outside of California may comprise an additional 15 to 30 million km<sup>2</sup>. Assuming the most liberal estimates of a 30 million km<sup>2</sup> winter range, this represents a tiny fraction of the North American land area and, likely, this species former winter range.

### **Seasonal Status in California**

Most post-breeding flocks depart breeding grounds in Colorado from mid-July to August (Knopf and Rupert 1996). Although occasional individuals or small groups arrive in California before September, the build up of wintering populations occurs from September through November with

peak numbers usually observed from December through February. Wintering flocks depart California from February to mid-March and birds arrive on the Colorado breeding grounds in late March (Graul 1973).

### **Historical Range and Abundance in California**

Coues (1874) documented use of coastal plains in Ventura and Los Angeles counties, California. Grinnel and Miller (1944) described distribution to include the southern Sacramento valley south through the central valley and extending to the southern coastal plains. They also noted occurrences from San Miguel and San Clemente islands.

Based on anecdotal reports and personal communication with knowledgeable individuals, Laun (1957) depicted the California range to include the entire Central Valley south of roughly Sacramento County, and a broad region encompassing the southern coastal plain and southern coastal interior valleys. In addition, Laun's map described a range including south Central San Diego County, southeastern Los Angeles County and the Imperial Valley.

Wintering mountain plovers were once abundant on the coastal plains and interior valleys from Ventura County to San Diego County, including western Riverside County. Loss of habitat to urbanization in these areas has restricted the range of these birds to scattered localities in coastal Orange and San Diego counties and in the San Jacinto Valley. They formerly wintered in the Santa Clara Valley, and, rarely, on coastal plains east of San Francisco Bay. Although reported as an abundant winter visitor on some of the Channel Islands in the past, they now occur there rarely or irregularly.

In the early 1900's, large numbers of Mountain Plovers were reported in California on both grasslands and agricultural lands Knopf (1996). At that time, California supported approximately 8,900,000 ha (22 million acres) of grasslands with about 20 percent occurring in the central valley (Moore et al 1990). Currently, grassland habitat has been nearly extirpated in the San Joaquin valley with less than 60,700 ha (150,000 acres), or less than 1%, remaining. During the past 80 to 100

years, conversion of grassland habitats to urban and agricultural uses proportionately exceeded conversion of any other habitat type (Ewing et al 1988, Moore et al 1990). As a result, this species range in the central valley is likely less than 10% of it's former extent, despite it's adaptation to using disked and irrigated agricultural fields.

Graul and Webster (1976) estimated the continental population at between 214,200 and 319,200 individuals but later acknowledged in a personal communication that his estimate was probably too high by an order of magnitude (Knopf 1996). Knopf (1996) estimated a current North American population size of 8,000 – 10,000 individuals and a population decline rate, based on Breeding Bird Survey (BBS) data from 1966 – 1996, of 3.7% per year. Assuming this population estimate and decline rate estimate are correct, the North American population may have been 23,000 and 30,000 in 1966. Based on these numbers, and assuming the Hunting et al (2001) estimate of 85% of the population winters in California, the historical California population may have been between 19,500 and 25,500.

### **Recent Range and Abundance in California**

Hunting et al (2001) describe the current range of the species based on evaluation of data collected by volunteers and the Department of Fish and Game, CBC data, and accounts reported by Audubon and local birding organizations. It can be described as the central and eastern Sacramento and San Joaquin Valleys extending from about Butte County south to Kern and Ventura Counties; The Carrizo Plain in San Luis Obispo County and Panoche Valley in San Benito County; isolated populations at 3 locations along the San Luis Obispo, Ventura, and San Diego County coast lines; the Antelope Valley and Blythe areas of Riverside County; and the agricultural lands surrounding the Salton Sea in Imperial County.

Knopf (1996) estimates the current (1996) North American population at 8,000 – 10,000 individuals. This estimate was used by the U.S. Fish and Wildlife Service as a basis for the

proposed rule to list the Mountain Plover as a threatened species under the federal Endangered Species Act (USFWS 1999).

### **Ecological Requirements**

Primarily insectivorous. In Colorado, 99.7% of dry matter consumed were arthropods of which 60% were Tenebrionid beetles (Baldwin 1971). Bent (1929) states primary food sources are grasshoppers but that crickets, beetles, and flies are also consumed. Olson (1985) identified grasshoppers, beetles, and crickets as major food items.

In the Central Valley, Mountain Plovers select recently disked, barren, or burned sites for foraging and roosting (Knopf and Rupert 1995). Hunting et al (2001) noted that a majority of observations of Mountain Plovers in the Central Valley were on barren or burned sites. In the Salton Sea region, birds apparently select recently burned sites over vegetated agricultural lands.

Typically congregate in flocks of between 2 and 1200 (exceptional) birds and may travel relatively long distances each day presumably in search of suitable foraging habitat. Knopf and Rupert (1995) noted daily travel between the Carrizo Plain in San Luis Obispo County and the northern San Joaquin Valley.

See Knopf (1996) or Hunting (1998) for summary of information on habitat use, diet, reproduction, and other life history attributes associated with the breeding population.

### **Threats**

Loss of breeding habitat as a result of conversion of native grasslands to wheat production and other agricultural uses is the primary decline factor (Knopf 1996, Knopf and Rupert 1995). Contributing decline factors include direct impacts (mortality) of nesting adults by vehicles associated with agricultural and oil production activities, and reproductive sinks associated with delayed grain planting resulting in nest abandonment as grasses become too tall for effective predator avoidance.

In California, continuing loss of grassland habitat has been implicated in declines (Hunting et al 2001, Knopf 1996) apparently forcing foraging and roosting birds in to presumably sub-

optimal agricultural, barren, and burned sites. In addition, the conversion of historical coastal plain grasslands and playas to urban, industrial, and recreational uses has contributed to near extirpation along the southern California coast.

In the early 1990's researchers postulated that Mountain Plovers may be highly susceptible to impacts from pesticides and other contaminants due to proximity to aerial spraying and ground applications on agricultural lands on both breeding and wintering grounds. Iko, et al (1997) measured cholinesterase (ChE) levels in Mountain Plovers from fields in the California central valley, where pesticide exposure events were known to have occurred within 24-48 hours of sampling (sample), and from the Carrizo Plain (no pesticide use, control) and found no significant difference in ChE activity. Knopf (1996) noted that pesticides are probably not a factor contributing to steep population declines. However, the physical and physiological effects from inhaling concentrated aerosol contaminants and "agrofog" through the complex Charadriid respiratory system needs further investigation.

### **Management and Research Recommendations**

- Investigate potential impacts from chronic exposure to agrochemicals in the central valley and Salton Sea areas.
- Consider Mountain Plover habitat use in federal and state habitat management programs on wildlife areas, ecological reserves, and state wildlife areas. Controlled burns should be timed to accommodate mid-winter Mountain Plover use.
- Incorporate Mountain Plover habitat considerations in regional conservation and land-use planning processes including Habitat Conservation Plans, Natural Community Conservation Plans, and local government land use planning (general and specific plans).

### **Monitoring Needs**

Monitoring of both breeding and wintering birds has been identified as the most immediate and important need (Knopf 1996). A monitoring program for this species should be statewide in scope and focus resources on consistent user areas including the Salton Sea, Carrizso Plain, and central Valley. Monitoring study design should ensure consistent, repeatable, and reliable methods which facilitate between-year comparisons (trend).

## **Acknowledgments**

## **Literature Cited**

- Anonymous. 1992. Revisions to list of Bird Species of Special Concern. Unpub. Rpt. Bird and Mammal Conservation Program, California Department of Fish and Game, Sacramento, CA.
- Baldwin, P.H. 1971. Diet of the Mountain Plover at the Pawnee National Grassland, 1970-71. Tech. Rept. 134. Grassland Biome, U.S. International Biological Program.
- Bent, A.C. 1929. Life Histories of North American Shorebirds, Part Two. Dover Publications, Inc., New York, New York.
- California Department of Fish and Game. 2001. Special Animals. Unpub. Rpt. of the Wildlife and Habitat Data Analyses Branch, Sacramento, CA. 46 pp. + App.
- Coues, E. 1874. Birds of the Northwest. Govt. Printing Office, Washington D.C
- Ewing, R.A., N. Tosta, R. Tuazon, L. Huntsinger, R. Marose, K., Nielson, R. Motroni, and S. Turan. 1988. California's forest and rangelands: growing conflict over changing uses. California Department of Forestry and Fire Protection. 348 pp with appendices.
- Graul, W.D. 1973. Adaptive aspects of the mountain plover social system. *Living Bird* 12:69-94.
- Graul, W.D., and L.E. Webster. 1976. Breeding status of the mountain plover. *Condor* 78:265-267.
- Grinnell, J., and A.H. Miller. 1944. The distribution of the birds of California. *Pacific Coast Avifauna* 27:138-139
- Hunting, K, S. Fitton, and L. Edson. 2001. Distribution and habitat associations of the mountain plover (*Charadrius montanus*) in California. *Trans. of the West. Section of the Wild. Society* (in press).
- Hunting, K. 1988. Species Account for the Mountain Plover for the Partners in Flight Grassland Bird Conservation Plan. California Partners in Flight.  
<http://www.prbo.org/CPIF/Grasslnd/MOPL.html>

- Iko, William M., A. Archuleta, F. Knopf, and L.R. DeWeese. 1997. Organophosphate and carbamate exposure and possible cholinesterase (ChE) inhibition in wintering mountain plovers (*Charadrius montanus*). In Craig G., and Mumma, J.W. (Coords.), Mountain Plover Workshop, A Synopsis of Presentations. Colorado Division of Wildlife, Ft Collins, CO.
- Knopf, F.L. 1996. Mountain plover (*Charadrius montanus*). In The Birds of North America. Editors: A. Poole and F. Gill. Number 211. The Academy of Natural Sciences, Philadelphia, and The American Ornithologists' Union, Washington, D.C. 16 pp.
- Knopf, F.L., and J.R. Rupert. 1996. Reproduction and movements of mountain plovers breeding in Colorado. Wilson Bulletin 108:28-35.
- Knopf, F.L., and J.R. Rupert. 1995. Habits and habitats of mountain plovers in California. Condor 97:743-751.
- Laun H.C. 1957. A life History study of the mountain plover *Eupoda montana* (Townsend) on the Laramie Plains, Albany County, Wyoming. Master's Thesis. Univ. of Wyoming. 67pp
- Moore, S., J. Winckel, S. Detwiler, S. Klasing, P. Gaul, N. Kanim, B. Kesser, A. DeBevec, K. Beardsley, and L. Puckett. 1990. Fish and wildlife resources and agricultural drainage in the San Joaquin Valley, California. Volume 1. San Joaquin Valley Drainage Program, Sacramento, California. 364+ pp.
- Olson, S.L. 1985. Mountain plover food items on and adjacent to a prairie dog town. Prairie Nat. 19:233-238.
- Point Reyes Bird Observatory. 1997. Partners in Flight Bird Conservation Plans. Unpub. Rpt. <http://www.prbo.org/CPIF>.
- Remsen, J.V., Jr. 1978. Bird Species of Special Concern in California; an annotated list of declining and vulnerable species. California Department of Fish and Game, Wildlife Management Branch Administrative Report (78-1):1-54
- U.S. Fish and Wildlife Service. 1995. Migratory nongame birds of management concern in the United States: The 1995 list. Office of Migratory Bird Management, Washington, D.C. 17 pp.
- U.S. Fish and Wildlife Service. 1999. Proposed threatened status for the mountain plover, Federal Register 7587-7601.